

**ANNEX ONE
TO THE
REIMBURSABLE UMBRELLA SPACE ACT AGREEMENT
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AMES RESEARCH CENTER
AND
SKYTRAN INC.
FOR
RIDE QUALITY STUDY IN THE VERTICAL MOTION SIMULATOR**

ARTICLE 1. PURPOSE

The Vertical Motion Simulator can inform skyTran design of the shaping and layout of its transportation infrastructure (“guideway”) and the best motion and suspension operation of the vehicles. In order to optimize ride comfort in a maglev vehicle, skytran will provide simulation data for the expected ride comfort in a range of different motion profiles (including, rapid acceleration and deceleration, ascent and descent slopes, and curves with differing degrees of turn coordination). Also, skyTran has developed a smart phone based app that collects subjective ride comfort data and analyzes how it correlates to 6 axis motion of the seated passenger. This data and app will be provided to NASA ARC for the Ride Quality study using the Vertical Motion Simulator.

NASA SimLab will provide the systems to test these different motion profiles with a sufficiently large representative number of subjects to ascertain the level of aggressive motions that passengers can sustain without experiencing unacceptable discomfort. This study is not meant to explore limits of safety, rather what would be comfortable to a wide spectrum of passengers demographics. skyTran and NASA will work together to design and conduct the experiment, analyze the data and produce a report showing passenger comfort assessments of various motion profiles.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113(e)).

ARTICLE 2. RESPONSIBILITIES

A. NASA ARC will use reasonable efforts to:

- a. Support skyTran with literature search of past Passenger Comfort studies, and with development of the Experiment Design, and a Simulation Test Plan.
- b. Provide information to skyTran for IRB paperwork for the experiment.
- c. Configure an integrated simulation system to study passenger ride quality assessment for motion profiles provided by skyTran. Simulation system will include the VMS motion platform, Ride Quality Passenger Cab, out-the-window (OTW) visual database, lab graphics, and other subsystems as per Simulation Test

- Plan.
- d. Provide SimLabs staff to execute a 1-day pilot study (with 2-4 test subjects) to validate experiment protocols and refine the experimental design.
 - e. Provide SimLabs staff to conduct a full-scale experiment for 8 days to collect passenger comfort assessments from participant subjects as defined in the Simulation Test Plan.
 - f. Deliver simulation data to skyTran as per Simulation Test Plan.
 - g. Assist skyTran to analyze and interpret collected data, and compile report of the study and its findings.

B. Partner will use reasonable efforts to:

- a. Provide final versions of the Experiment Design, and the Simulation Test Plan.
- b. Provide vehicle trajectory motion profiles in the format as defined by the SimLabs VMS team.
- c. Provide visual database information as per simulation requirements.
- d. Provide technical support as needed during simulation development, integration and test.
- e. Provide on-site staff during pilot study (1-day) and full scale experiment (8-days).
- f. Obey all relevant rules concerning simulation operations and safety at NASA SimLabs.
- g. Reimburse NASA appropriate amounts to cover the full cost of the project.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

Milestones	Estimated Completion – in weeks from agreement execution:
Complete Literature Search and Experiment Design (skyTran and NASA)	Within 5 weeks
Provide Final Test Plan (skyTran)	Within 6 weeks
Complete Simulation integration and test, and pilot-study (skyTran and NASA)	Within 10 weeks
Conduct Simulation Operations for 8 Days (skyTran and NASA)	Weeks 11 and 12
Support data analysis and provide inputs for final report (NASA)	Within 16 weeks

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$310,755 (three hundred and ten thousand, seven hundred and fifty five dollars) for NASA to carry out its responsibilities under this Annex.

Each payment shall be marked with Ames Research Center – Annex One.

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within six months after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement.

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of five (5) years. The Parties agree that the following Data first produced by NASA would be Proprietary Data if obtained from Partner and will be protected for the five year period:

- Results of testing
- Final reports of testing

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:
 - Skytran motion profiles.
 - Sketches or images
 - Test plans (or data that forms part of a test plan)
 - Specifications or performance of Partner hardware/software
2. Third Party Proprietary Data:
 - None.
3. Controlled Government Data:
 - None.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:
None.

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties here to, or eighteen months from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing sixty (60) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Technical Points of Contact

NASA Ames Research Center
Steven D. Beard
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Management Points of Contact

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Agreement Manager
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ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AMES RESEARCH CENTER**

BY: Huy Tran
Huy Tran
Director of Aeronautics

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Reid Westwood
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BY: Reid Westwood
Reid Westwood
CEO

DATE: July 2, 2021

DATE: 6/28/2021